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Note on two Photographs of the Nebulæ in the Pleiades taken in October 1886. By Isaac Roberts.

On the night of October 23 (last month), I had an opportunity of taking a photograph of the *Pleiades*, and intended to expose the plate for three hours so as to be able to compare the result with that obtained by MM. Henry, but clouds caused me to stop the exposure after eighty-nine minutes. The plate when developed showed clearly that the stars *Alcyone*, *Maja*, *Electra*, and *Merope* are surrounded by nebulæ, indications of which about three of the stars are shown on MM. Henry's chart, which is published in the *Annales de l'Observatoire de Paris.*

On the following night (the 24th) I exposed another plate for three hours, which, after development, showed that not only are the stars which I have just named surrounded by nebulæ, but that the nebulosity extends in streamers and fleecy masses, till it seems almost to fill the spaces between the stars, and to extend far beyond them. It suggests the probability that these principal stars in the *Pleiades*, together with many of the stars around them, are involved either directly or else in sight alignment with one vast nebula. The negatives and the enlargements to six diameters, which I now exhibit, will enable you to appreciate and to form your own judgment as to the credibility of the evidence upon which these inferences rest, and I await with watchfulness for a clear interval which will enable me to try an exposure of *five hours* in order to obtain more light upon the subject.

The star discs upon the photographs are somewhat deformed by refraction and uncorrected instrumental movements, but I think you will not have much difficulty in mentally making the corrections necessary to form accurate judgment; and I anticipate being able to obviate this slight distortion in future exposures.

The Orbit of Comet II., 1883, *discovered by Mr. Ross.*
By Lieut.-General J. F. Tennant, R.E., F.R.S.

Some considerable time ago I made some efforts to get a satisfactory orbit for this comet, but circumstances were unfavourable and I had to give it up. More recently I was induced to take it up to see if there were any real departure from a Parabolic Orbit such as Mr. Bryant found, or whether his result was only due to the selection he had made of observations. My conclusion was that there was no real justification for departing from the parabola. Then I found that the compilers of the *Annuaire du Bureau des Longitudes* had adopted Mr. Bryant's

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results, and I made some further calculations. I now offer my results for publication lest what I think a mistake should pass unnoticed.

Starting with Mr. Tebbutt's orbit as an approximation, I computed an ephemeris from January 10 to February 6, 1884, for each Greenwich noon, and with this compared the whole of the observations at Melbourne,* Windsor, and Madras. The Melbourne observation of January 17 is affected with considerable error, and I was obliged to reject it. The mean of the observations at Madras on January 26, and the observations at Madras on January 30, at Melbourne on February 1, and Windsor on February 2, are somewhat discordant, but I have not excluded them, as I did not think they would materially affect my result. I then proceeded to obtain normal places, and found the error of my ephemeris to be

On Jan. 17·0	in R.A. +51″·4	in Decl. −34″·3
26·5	+39·8	−26·0
30·0	+29·8	−24·0

From the places found by applying these corrections to the ephemeris I computed a parabolic orbit with the following result:

$$T = \text{Perihelion Passage 1883, Dec. } 25{\cdot}31928$$

$$\log q = 9{\cdot}4938146$$

$$\left.\begin{aligned}\pi &= 43^\circ\ 30'\ 48''{\cdot}5\\ \Omega &= 264\ \ 33\ \ 13{\cdot}5\\ L &= 114\ \ 59\ \ 03{\cdot}1\end{aligned}\right\}\text{Mean Equinox, Jan. 0, 1884}$$

which give at the middle date

$$\lambda_c - \lambda_0 = +11''{\cdot}2$$

$$\beta_c - \beta_0 = -\ 9{\cdot}6$$

a result larger than I had anticipated from the errors of the ephemeris at the selected times.

By forming equations of condition for the effects of small changes in the elements, I obtained the following elliptic orbit:

$$T = 1883, \text{ Dec. } 25{\cdot}320145$$

$$\log q = 9{\cdot}4899874$$

$$e = 0{\cdot}9980441$$

$$\left.\begin{aligned}\pi &= 43^\circ\ 33'\ 16''{\cdot}8\\ \Omega &= 264\ \ 51\ \ 04{\cdot}0\\ L &= 115\ \ 03\ \ 44{\cdot}3\end{aligned}\right\}\text{Mean Equinox, Jan. 0, 1884.}$$

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[*] I have used the corrected observations in the "Astronomische Nachrichten." Those published in the *Monthly Notices* have great error.

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The period would be 1,986 years, but, of course, the deduction of so long a period from such data is not to be considered as giving it any certainty.

Having the equations of condition I proceeded to see what would be the most probable parabola from the normal places, and found

$$T = 1883,\ \text{Dec. } 25{\cdot}319222$$

$$\log q = 9{\cdot}4938953$$

$$\left.\begin{aligned} \pi &= 43^\circ\ 30'\ 40''{\cdot}4 \\ \Omega &= 264\ \ 32\ \ 54{\cdot}4 \\ L &= 114\ \ 39\ \ 01{\cdot}9 \end{aligned}\right\}\text{Equinox as before.}$$

The errors at the times of the normal places, as obtained from the equations of condition.

C − O at	in R.A.	in Decl.
1st date	+4″·43	+1″·74
2nd	−7·98	+7·42
3rd	+2·49	−1·76

leading to a probable error of ± 4″·8 in the determination of one element, which seems possible enough when one looks at the individual observations. But it would have been preferable to give more weight to the middle place, as the observations about the middle of the apparition are the best.

On the whole I think that we have no sufficient data for assigning elliptic elements, and that the parabola last given is about as good as any which can be deduced from the observations, though the real orbit may be an ellipse of long period.